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A new species of the genus *Anyphaena* (Araneae: Anyphaenidae) from Japan

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Abstract — A new species of the spider genus *Anyphaena* (Araneae: Anyphaenidae), *Anyphaena yoshitakei* sp. nov., is described on the basis of specimens obtained from the Ryukyu Islands, Japan. The male palpal structure of this species is similar to those of males of *A. taiwanensis* and *A. pugil*, but this species can be distinguished by the lack of palpal femur spines. The female can be easily distinguished from females of Asian congeneric species by the shape of the longitudinal middle furrow of the epigyne.

Key words — *Anyphaena*, new species, taxonomy, Kagoshima Prefecture, Okinawa Prefecture

Introduction

The spider genus *Anyphaena* (Araneae: Anyphaenidae), known as tree wandering spiders, is composed of 84 species distributed mainly in the New World (World Spider Catalog 2017). Very few species of this genus are distributed in Asian countries (Song et al. 1999, Chen & Huang 2010), and only two species, *A. ayshides* and *A. pugil*, have been recorded in Japan (Tanikawa 2017). Here, we describe a new species of this genus, *A. yoshitakei* sp. nov., from Japan on the basis of specimens collected from the Ryukyu Islands. This is also the first distributional record of this genus in the subtropical region of Japan.

Materials and methods

Specimens were obtained by arthropod surveys on the islands of Okinawa-jima and Takara-jima. The field survey on Takara-jima Island, in the Tokara Islands, was conducted in March 2017 by Dr. Hiraku Yoshitake, Institute for Agro-Environmental Sciences, NARO. Morphological features were observed under a stereomicroscope (SMZ1000, Nikon Corp. Tokyo Japan; or M3Z, Wild Heerbrugg AG, Heerbrugg, Switzerland). All measurements were taken with a micrometric ocular on the stereomicroscope. Photographs were taken with an EOS Kiss X7 digital camera (Canon Inc., Tokyo, Japan) connected to the microscope. Specimens of the type series designated in this paper have been deposited in the collections of the National Museum of Nature and Science, Tokyo, and other specimens have been deposited at the Institute for Agro-Environmental Sciences, National Agriculture and Food Research Organization (NARO).

The name of each part of the male palp was according to Platnick (1974). The following abbreviations are used: ALE, anterior lateral eye; AME, anterior median eye; PLE, posterior lateral eye; PME, posterior median eye. Distances between the eyes are expressed as e.g., "ALE–AME". All measurements are in millimeters.

Anyphaena yoshitakei sp. nov.
[Japanese name: Yoshitake-izutsu-gumo]
(Figs. 1A–G)

Type series. Holotype: 1♀, Takara-jima Island, Kagoshima Prefecture, 7〜8-III-2017, H. Yoshitake leg. (NSMT-Ar 14748). Paratypes: 1♀, same information as for holotype (NSMT-Ar 14749); 1♂, Nago City, Okinawa-jima Island, Okinawa Prefecture, 15-XII-2010, A. Tanikawa leg. (NSMT-Ar 14765).

Other specimens. *A. yoshitakei*: 1♀, Nago City, Okinawa-jima Island, Okinawa Prefecture, 25-XII-2009, A. Tanikawa leg.; 1♀, Nago City, Okinawa-jima, Okinawa Prefecture, 17-IV-2015, A. Tanikawa leg.

Diagnosis. Male of this species has genital morphology similar to males of *A. taiwanensis* and *A. pugil*, but it can be clearly distinguished from them by the lack of palpal femur spines (Fig. 1E). Furthermore, the shape of median apophysis of this species is quite different from that of *A. taiwanensis*; the median apophysis of *A. taiwanensis* is slender, whereas that of *A. yoshitakei* is round (Fig. 1F, arrow). On the other hand, there is no clear difference in the shape of male palp between *A. pugil* and *A. yoshitake* other than the presence or absence of femur spines. Female of this species can be easily distinguished from that of *A. pugil* by the shape of the longitudinal middle furrow on the epigyne (Figs. 1C–D); the furrow is wider and curved than that of *A. pugil*. On the other hand, female of this species resembles *A. taiwanensis* in shape of epigyne, but can be distinguished

Table 1. Measurements of leg segments of *Anyphaena yoshitakei* sp. nov. (♀/♂; in millimeters).

Leg	Femur	Patella	Tibia	Metatarsus	Tarsus	Total
I	2.42/2.12	1.06/0.88	2.33/2.36	1.73/1.76	0.97/1.06	8.51/8.18
II	2.24/2.21	1.06/0.88	2.33/2.36	1.73/1.76	0.97/1.06	8.33/8.27
III	1.82/1.73	0.82/0.79	1.42/1.45	1.36/1.36	0.70/0.67	6.12/6.00
IV	2.30/2.27	0.94/0.85	1.94/1.97	2.06/2.18	0.82/076	8.06/8.03

by the stronger central constriction of the furrow, like a bottleneck (Fig. 1C, arrow) and unique structure of spermathecae (Fig. 1D).

Description. The following is based on the female holotype (NSMT-Ar 14748) and the male paratype (NSMT-Ar 14765). Measurement (♀/♂), total body length: 6.71/4.47; carapace dimensions: length 2.50/2.19, width 2.06/1.81; abdomen dimensions: length 4.81/2.56, width 3.50/1.75; clypeus height 0.12/0.06; sternum: length 1.48/1.27, width 1.00/0.91; diameters of AME 0.12/0.09, ALE 0.15/0.12, PME 0.12/0.12, PLE 0.15/0.12; eye field: ALE–ALE 0.61/0.52, PLE–PLE 0.85/0.70, AME–AME 0.30/0.24, PME–PME 0.45/0.39, AME–PME 0.36/0.42.

Measurements of legs are shown in Table 1.

Female (Fig. 1A). Carapace brown, with dark brown markings on both margins; thoracic groove prominent. Chelicerae brown, promargin of fang groove armed with 3 triangular teeth. Labium brown. Sternum brown, bordered with dark brown margin. Abdomen oblong, dorsum pale brown covered with dark brown markings on midline and posterior end, venter pale brown with transverse tracheal spiracle located about midway from epigastric furrow to anterior spinnerets. Legs pale brown, with tibiae, metatarsi, and tarsi of all legs dark brown.

Male (Fig. 1B). Similar to female in body shape, coloration and markings. Triangular pyramidal hairs gathered between tracheal spiracle and spinnerets.

Male palp (Figs. 1E–G). Palpal femur bears triangular protrusion (Fig. 1E, arrow); retrolateral tibial apophysis elliptical in ventral view, having small protrusion near the base. Median apophysis rounded, conductor bent apically (Fig. 1F, arrow).

Female genitalia (Fig. 1C, D). Epigyne bears a longitudinal middle furrow with a narrowed center like a bottleneck (Fig. 1C, arrow); seminal duct relatively thick (Fig. 1D).

Variation (4♀). Ranges are minimum–maximum values (mm) for female. Total body length: 4.47–6.70; carapace dimensions: length 2.38–2.63, width 1.81–2.06; abdomen dimensions: length 2.50–4.81, width 1.44–3.50; abdomen length/width 1.36–1.74; diameters of AME 0.09–0.12, ALE 0.12–0.15, PME 0.09–0.12, PLE 0.12–0.15; eye field: ALE–ALE 0.55–0.67, PLE–PLE 0.79–0.91, AME–AME 0.27–0.33, PME–PME 0.39–0.48, AME–PME 0.36–0.45.

Distribution. Japan (Takara-jima and Okinawa-jima Islands)

Etymology. The specific name is dedicated to Dr. Hiraku Yoshitake of the Institute for Agro-Environmental Sciences, NARO, who is an enthusiastic collector of Japanese spiders and who collected the designated type specimens of this new species on Takara-jima Island.

Note. A closely related species, *A. taiwanensis*, has been found in the high mountainous regions (above 2000 m in altitude) of Taiwan (Chen & Huang 2010), but *A. yoshitakei* was collected in low-altitude areas (below 250 m), indicating a difference in suitable bioclimatic conditions between these related species.

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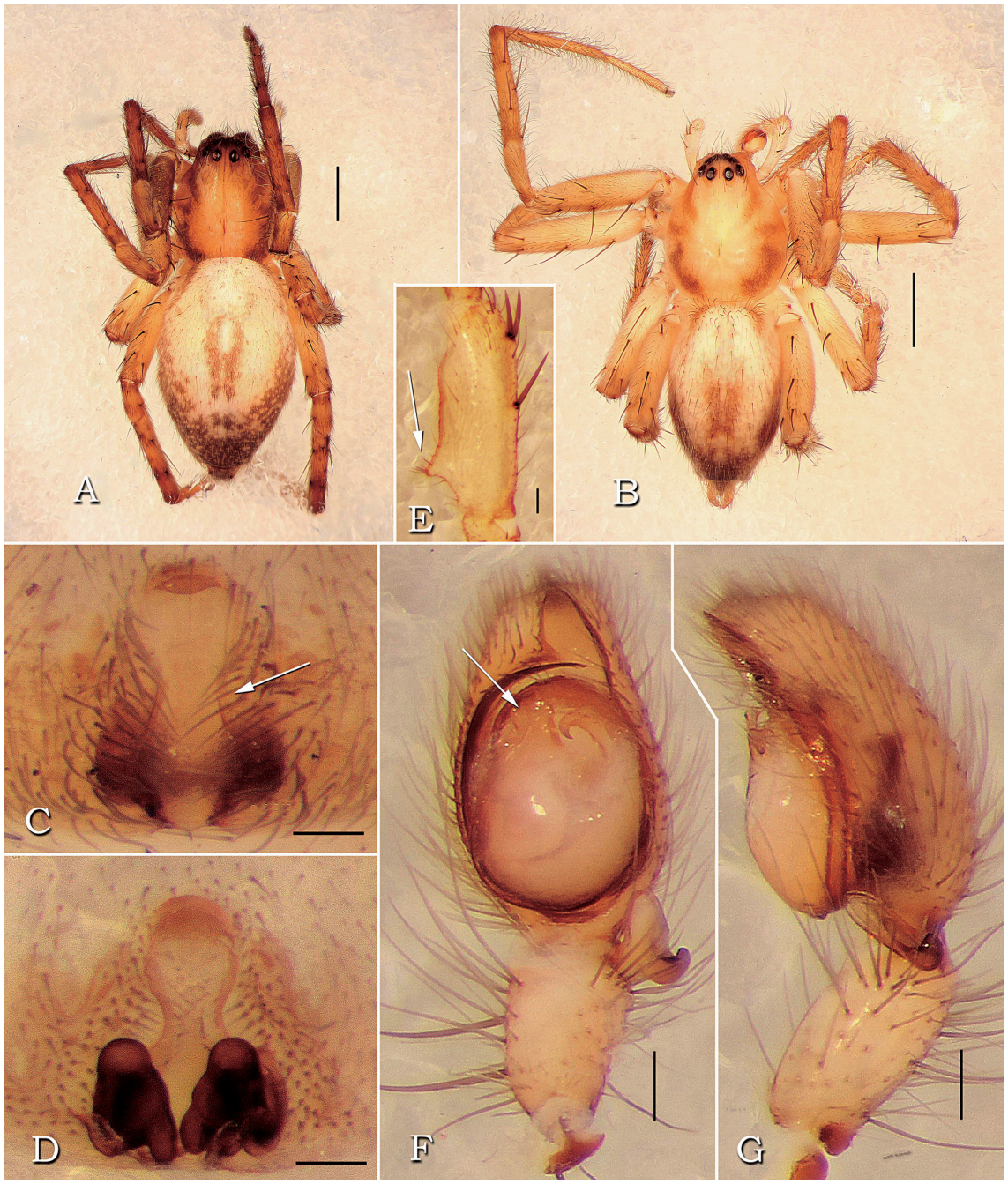

Fig. 1. *Anyphaena yoshitakei* sp. nov. A, female habitus (holotype: NSMT-Ar 14748); B, male habitus (paratype: NSMT-Ar 14765); C, epigyne, ventral view (holotype); D, same, dorsal view (paratype: NSMT-Ar 14749); E, femur of male palp, retrolateral view (paratype); F, male palp, ventral view (paratype); G, same, retrolateral view (paratype). Scales = 1 mm (A–B); 0.1 mm (C–G).